Appendix A:

Uniform Methodology and Assumptions

APPENDIX A

Uniform Methodology and Assumptions

To facilitate comparisons across the eight coverage expansion proposals, we developed a standard set of assumptions that we applied uniformly across these plans. While it is difficult to predict the precise impact of these proposals, the use of a standard methodology assures that comparisons of results across these plans reflect differences in program design rather than mere inconsistencies in assumptions. In addition, all estimates were developed using the Lewin Group Health Benefits Simulation Model (HBSM) which is based upon the 1996 Medical Expenditures Panel Survey (MEPS) data and the March 1999 Current Population Survey (CPS).

For proposals that expand coverage under Medicaid and/or the State Children's Health Insurance Program (SCHIP), we developed assumptions on how states would respond to new options to expand eligibility that we applied uniformly to each proposal. Because not all eligible persons enroll in Medicaid, we also specified uniform assumptions on the proportion of newly eligible persons who would enroll under these expansions given their economic and demographic characteristics. We also developed a uniform methodology for simulating how employers and individuals would respond to various proposals to expand private coverage through tax subsidies or voucher programs. In addition, we developed a uniform set of assumptions that we used to estimate the impact of the universal coverage proposals introduced by two of the participating organizations.

The data and methods used in our analyses are presented in the following sections:

- Medicaid/SCHIP Expansions;
- Private Insurance Subsidies;
- Changes in Insurance Markets;
- Universal Coverage Proposals; and
- Caveats

A. Medicaid/SCHIP Expansions

The cost and coverage impacts of the various proposals to expand coverage under Medicaid or SCHIP will be driven by our assumptions on how states and the newly eligible populations respond to these programs. To facilitate comparison across the eight coverage expansion proposals, we developed assumptions on the behavior of states and the newly eligible population, which we applied uniformly to the Medicaid/SCHIP provisions under each proposal.

1. State Level Coverage Decisions

Several of the coverage 2000 proposals would give states the option of expanding eligibility for selected population groups. States are assumed to respond to these opportunities as follows:

- States are assumed to implement all mandatory expansions in coverage (mandatory coverage expansions typically take the form of conditioning continued receipt of Medicaid/SCHIP funding on state compliance with these coverage expansions);

- States are assumed to increase eligibility for parents and pregnant women to their current SCHIP income eligibility level if the proposal includes enhanced federal matching rates for this group (states can already expand coverage for these groups to higher income levels at the standard Medicaid matching rate by specifying increased income exclusions);

- Due to the high cost of covering non-disabled childless adults (costs are high due to the large number of persons in this group), we developed more restrictive rules on how states respond to an option to cover this group under Medicaid/SCHIP. These are:

  - If the program uses the standard federal matching rate, we assume that childless adults would be covered up to only the medically needy level (typically about 50 percent of the federal poverty level (FPL)) in those states that have a medically needy program. No eligibility expansions for childless adults are assumed in other states;

  - If the program includes an enhanced federal matching data, we assume that all states cover childless adults to the poverty level. We also assume that states that currently cover childless adults through a Medicaid waiver or under a state-only program with comprehensive benefits would increase eligibility to the SCHIP income eligibility level in the state. These states include New York, Washington, Oregon, Minnesota, and Hawaii.

- In some proposals, states would obtain an increase in the federal matching rate if they succeed in increasing the enrollment rate among both these who are newly eligible under the expansions and those who are eligible under the current program. For illustrative purposes, we assume that these provisions succeed in attracting 10 percent of those who are currently eligible but not participating in the program. We assume that this will result in an increase in the federal matching percentage (i.e., the percentage of program costs paid by the federal government) would increase by an average of 1.0 percentage points.[1,2]

- Proposals that merely "encourage" states to adopt coverage expansions that are already permitted under current law are assumed to have no impact on coverage unless they include additional economic incentives for the states to expand coverage, such as an enhanced federal matching rate;

- Unless otherwise specified in the proposal, coverage expansions are assumed to apply only to U.S. citizens and persons legally residing in the U.S. who meet existing eligibility criteria (i.e., satisfy the five year waiting period requirement);

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[1] The federal matching percentage currently ranges between 50 percent and 75 percent by state.

[2] While these proposals include specific formulas for determining the change in matching rates for each state, we have neither the data nor a basis for the assumptions required to simulate these formulas. Consequently, we adopted these simplifying assumptions.

- States are assumed to require enrollee premium contributions under the expansions only in states that now require such contributions under their state's SCHIP program. The amount of the premium and the income levels at which premiums are required is assumed to be the same as in the state's current SCHIP program for each newly eligible expansion group unless otherwise specified in the proposal;

- The cost of coverage is estimated based upon state-by-state per enrollee cost data obtained from the Health Care Financing Administration's (HCFA) 2082 forms by eligibility group (i.e., children, parents, etc.).[3] Costs for non-disabled childless adults, who generally are not covered by state Medicaid programs, are based upon average costs for AFDC adults adjusted to reflect the unique age and sex composition of the childless adult population. Thus, our estimates of the cost of covering newly eligible groups reflect differences in covered services and cost by state and eligibility group; and

- We assume that states expand coverage according to the assumptions listed above regardless of whether a tax credit or voucher program is also created as part of the coverage expansion proposal. In fact, to minimize long-term spending obligations, some states may refrain from expanding eligibility under the Medicaid or SCHIP programs in anticipation that needy people would be able to obtain coverage under a federally funded voucher or tax credit.

The cost of these expansions in Medicaid and/or SCHIP coverage are assumed to increase each year in proportion to the increase in total costs for children and adults under the current program as projected by the Congressional Budget Office (CBO) for 2001 through 2010. This results in an average annual rate of growth in total program costs of about 8.0 percent, which reflects both expected growth in enrollment and per capita costs.

2. Medicaid Eligibility Simulations

For analyses of expansions in the Medicaid program we used the Medicaid Eligibility Simulation Module (MedSIM) of HBSM. MedSIM is based upon the March current Population Survey (CPS) data. We used the CPS because it is the largest and most recent data base available that provides the detailed family structure and income information required to simulate the impact of narrowly defined incremental changes in eligibility rules. To improve sample size for these small eligibility groups, we pooled the CPS data for March of 1998 and March 1999 to form a single simulation database.

As part of this process, we corrected the CPS data for underreporting. As in most household surveys, some individuals fail to report whether they were enrolled in Medicaid and/or the various public assistance programs. In fact, the CPS reports about 23 percent fewer Medicaid enrollees than program data show actually partipicated in the program. To correct for this problem, we identified persons who appear to be eligible for Medicaid in these data and assigned

[3] The per-capita cost data is computed as the per member per month cost (PMPM). This was computed from the HCFA 2082 data by dividing total annual costs for each eligibility group over total number of enrollee months. Enrollee months for each eligibility group was computed using full year enrollee and part year enrollee month data reported by states in the HCFA 2082.

a portion of them to Medicaid covered status. The resulting data replicate program control totals on enrollment by class of eligibility (see ***Attachment A***).[4]

In addition, it was necessary to calibrate these data to reflect the expansions in coverage under SCHIP that have occurred since these data were collected. We did this by simulating eligibility and enrollment for newly eligible children under SCHIP using the same methods and participation assumptions that we used to simulate the Coverage 2000 eligibility expansions proposals as discussed below. We estimate that by 2001, SCHIP enrollment will grow to 4.2 million children (children enrolled some time during the year), of whom 2.2 million would have been uninsured in the absence of the program.

The model will simulate a wide variety of Medicaid policy changes including changes in income eligibility levels for selected population groups such as children, parents, two-parent families, and childless adults. It also models changes in certification period rules, changes in the deprivation standard (i.e., hours worked limit) for two-parent families, "deeming" of income from persons outside the immediate family unit, and other refinements in eligibility. The model is also designed to simulate the unique features of the Medicaid program including month-by-month simulations of income eligibility and simulates the unique family unit definitions used in the program.

MedSIM estimates the number of persons eligible for the current Medicaid program and various eligibility expansions using the actual income eligibility rules used in each state for Medicaid and SCHIP. The model simulates enrollment among newly eligible persons based upon estimates of the percentage of persons who are eligible for the current program who actually enroll (See ***Attachment A***). In addition, it simulates the lags in enrollment during the early years of the program as newly eligible groups learn of their eligibility and enroll. As discussed above, the model estimates program costs based upon the per-person-per-month (PMPM) costs in the existing program in each state by eligibility group, which we adjust to reflect the unique age and sex composition of the newly eligible population.

3. Enrollment Behavior

Not all eligible persons are expected to enroll when they become eligible. For example, we have estimated that in 1997, only about 72 percent of those who are eligible for the existing Medicaid program were enrolled (includes cash- and non-cash eligible beneficiaries)[5]. We estimated the number of eligible persons who enroll under these coverage expansions based upon a multivariate model of enrollment among persons who are currently eligible under the existing Medicaid program, developed by the Lewin Group.

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[4] The model replicates average monthly enrollment data by class eligibility. The resulting data closely replicates duplicated counts of beneficiaries in that years (i.e., number of persons enrolled in years).

[5] This estimate may overstate the program enrollment rate because it predates some of the decline in Medicaid enrollment due to welfare reform. See: Sheils, J., Haught, R., "The Insurance Status of Medicaid Eligible Persons Not Participating in the Program: Estimates for Children and Other Eligibility Groups", (report to the Office of the Assistant Secretary for Planning and Evaluation, Department of Human Services), The Lewin Group, December 2, 1997.

This participation model reflects differences in the percentage of eligible persons who participate in Medicaid by age, income, self-reported health status, race/ethnicity, employment status and coverage from other sources of insurance. The model also reflects changes in the percentage of persons who participate based upon the premium contribution amount (if any) required under the program. This approach results in an average participation rate of about 65 percent among persons who are currently uninsured and about 30 percent among persons who have access to private coverage. (The process where individuals substitute public for private coverage is called "crowd-out".) A more detailed discussion of this enrollment model is presented in ***Attachment A***.

For illustrative purposes, we present detailed estimates of the cost and coverage impacts of these health proposals assuming the program is fully implemented in 2001. In this analysis, "full implementation" means that all state programs are established and adequately staffed. It also means that enrollment has reached the levels expected once the public has become generally aware of the program's existence.

These full implementation estimates for 2001 are useful in comparing the relative impacts of alternative health reform models in a given year using current year cost and uninsured population levels. However, these estimates overstate the likely level of enrollment and spending in the first year of the program (2001) because it will take time for individuals to become aware of their potential availability.

Based upon our experience with prior coverage expansions, we know that it may take two years or more before potentially eligible persons learn of their eligibility and apply for the program. Thus, it is unlikely that these programs will not reach the full implementation level of enrollment until the end of the second year of the program. For budgetary purposes, we developed 10 year cost estimates that reflect these expected lags in enrollment. We estimated the impact of these enrollment lags with the following assumptions:

- Enrollment is assumed to reach only 50 percent of the predicted level of enrollment (i.e., about 65 percent for the uninsured) on an average monthly basis in the first year of the program;

- Average monthly enrollment is assumed to reach 80 percent of predicted enrollment in the second year of the program; and

- Coverage expansions are assumed to reach their predicted level of enrollment in the third full year of the program and thereafter;

Our ten year cost estimates reflect these assumed enrollment lags.

4. Crowd-Out

"Crowd-Out" is a major concern for policy makers in considering coverage expansions under public programs. Crowd-out is the process whereby publicly subsidized coverage is substituted for private insurance. There are three general ways in which this can occur including:

- **Individual-based substitution** ("opt-out") is the process where individuals explicitly discontinue their private coverage to enroll in publicly subsidized coverage;

- **Employer-based substitution** ("push-out") is the process where employers explicitly reduce or eliminated health benefits with the expectation that these benefits would be provided to their workers and their dependents under the public program; and

- **Dynamic substitution** ("churn-out") is the phenomenon whereby lower income workers decline the employer coverage that is available to them as they change jobs and retain the publicly subsidized coverage that they obtained in prior months.

Dynamic substitution is potentially the most important form of crowd-out. For example, consider an individual who is unemployed and uninsured who enrolls in Medicaid/SCHIP in January. Once enrolled, the individual is "certified" to participate in the program for six to twelve months. Then this individual becomes employed two months later with an employer who offers coverage. Ordinarily, this individual is likely to have taken the employer coverage. However, because this individual is already certified to participate in Medicaid/SCHIP through the end of the year, the worker declines the employer coverage, which typically involves an employee premium contribution, and remains covered under Medicaid until they become ineligible. Indeed, at the higher income eligibility levels used under the proposed eligibility expansions, many of these individuals would still be eligible when it comes time to redetermine their eligibility.

Thus, crowd-out includes both overt acts by workers and employers to shift individuals from employer coverage to public plans and the less overt practice of retaining public coverage during periods where they otherwise would have taken employer coverage. These are processes that may or may not be encouraged by employers.

Several studies have attempted to estimate the extent of crowd-out using data on enrollment under public and private coverage during periods where Medicaid eligibility for poverty level children was expanded.[6] Although the precise research questions examined varied across studies, they generally attempted to estimate the percentage of enrollment for newly eligible children and pregnant women that was attributed to crowd-out. It is estimated that "at least 17 percent and possibly as much as 50 percent of the added coverage attributable to Medicaid expansions to cover low-income children and pregnant women might be offset by directly related reductions in private coverage."[7] While efforts have been made to reconcile the differences in estimates, a wide disparity remains. Much of the research in this area has been developed by two teams of researchers: David Cutler and Jonathan Gruber; and Lisa Dubay and Genevieve Kenney. Their study results include:

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[6] Beginning in 1989, there were a series of Medicaid eligibility expansions for children and pregnant women. Children through age 5 and pregnant women are eligible through 133 percent of the FPL. States also has the option of expanding eligibility for pregnant women to 185 percent of the FPL. Also, all children below the FPL who were born after September 30, 1983, are eligible for the program. Thus, all children below the FPL will be covered by 2001.

[7] Holahan, John. "Crowd-Out": How Big a Problem?" Health Affairs, January/February 1997.

- The Cutler and Gruber study examined data from 1987 through 1992 on women of childbearing age (15-44) and children made newly eligible via Medicaid expansions. They looked across states for differences in Medicaid eligibility and public and private insurance, controlling for economic and demographic factors of the population in each state. They attempted to separate the substitution effect from secular trends in employer coverage, but acknowledged that there is no definitive way to isolate one from the other.[8] Based on regression analysis, Cutler and Gruber found that the decline in private insurance was approximately 50% of the *increase* in Medicaid coverage induced by the Medicaid expansions. This study indicated that states with a greater increase in Medicaid eligibility had larger declines in private coverage when compared to states with smaller increases in Medicaid eligibility. The authors considered this to be strong evidence exemplifying substitution.

- The Dubay and Kenney studies examined the occurrence of substitution as Medicaid expanded into higher income ranges by focusing on poor (incomes below the FPL) and near poor (incomes between 100 percent and 133 percent of the FPL) populations. In one study, they found that "22 percent and 15 percent of the increase in Medicaid coverage for the near poor and poor respectively, is attributed to crowd-out. The weighted average for poor and near poor children was 17 percent. In a separate study, Dubay and Kenney estimated that "14 percent of the overall increase in Medicaid coverage for pregnant women that occurred between 1988 and 1991 is attributable to crowd-out of employer-sponsored coverage."[9]

It is important to note that the crowd-out estimates developed by the two research teams are not directly comparable. The Cutler and Gruber analysis estimated the "reduction in private insurance coverage as a share of the persons who enrolled in Medicaid directly as a result of the expansions" which they estimate to have been 50 percent.[10] Dubay and Kenney estimated "the reduction in private insurance as a share of the total increase in Medicaid coverage over this period," including both those who became eligible under the expansion and the increase in enrollment among persons who would have been eligible before the expansions.[11] Because many of the individuals who enrolled in Medicaid over the period of analysis were not eligible due to the expansion, the Dubay and Kenney method yields a smaller estimate of crowd-out. In fact, Cutler and Gruber indicate that when they recomputed their estimates according to the Dubay and Kenney method, their crowd-out percentage declines to 22 percent which is relatively close to the Dubay and Kenney estimate of 17 percent.[12] However, considerable debate continues over which result most appropriately represents the magnitude of the crowd-out that has occurred in the existing program.

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8 Cutler, D. Gruber, J. (1997, January/February). Medicaid and Private Insurance: Evidence and Implications. Health Affairs. 16 (1), 194-200.

9 Dubay, Lisa, and Genevieve Kenney, "Did Medicaid Expansions for Pregnant Women Crowd-Out Private Coverage?", *Health Affairs*, January/February 1997.

10 Cutler, David, M., Jonathan Gruber, "Medicaid and Private Insurance: Evidence and Implications,", *Health Affairs*, January/February 1997.

11 *ibid.*

12 *ibid.*

Unfortunately, neither of these estimates is appropriate for estimating the impact of further expansions in Medicaid/SCHIP eligibility in their current form. This is because the percentage of enrollees who shift from private plans to public coverage is expected to increase at higher income levels where private coverage is more prevalent. In fact, the Dubay and Kenney studies confirm that the incidence of crowd-out increases as income eligibility thresholds rise.[13] Thus, for this analysis, we needed to develop a "take up rate", which is an estimate of the percentage of persons with private coverage who take Medicaid when they become eligible for those who's access to employer coverage. For purposes of this analysis, children with access to employer coverage are defined to include children of with a parent who has employer sponsored coverage on their job.[14]

5. Take-Up Rate For Persons With Access to Employer-Sponsored Coverage

We developed estimates of these take-up rates for persons with access to employer-sponsored insurance (ESI) based upon coverage information on children who are eligible under the children's eligibility expansions using the 1997 March CPS data, which provides Medicaid coverage data for 1996. Eligible children include those in families with incomes between the cash assistance income eligibility level (on average about 50 percent of the FPL) and the income eligibility levels of the children's expansion population. The children's expansion population eligibility levels are 133 percent of the FPL for children through age 5; and 100 percent of the FPL through about age 13 in that year.[15] In these families, the children are eligible but the parents are not.

We used the CPS data to identify children who meet these income eligibility levels in families where the mother or father reported that they were covered by an employer-sponsored health plan (about 3.2 million; ***Figure 1***). Because nearly all health plans offer family coverage, we can use this as an estimate of the number of Medicaid eligible children who have access to ESI.[16] We then computed the proportion of children with access to ESI who were enrolled in Medicaid (about 1.5 million persons) which came to about 48.6 percent.

However, this estimate of the take-up rate for children with access to ESI overstates the incidence of crowd-out, because many of these children would have been uninsured in the absence of the Medicaid expansion anyway. The percentage of these children who would have been uninsured was estimated based upon the coverage status of similarly situated children living below the FPL who were not eligible for Medicaid. These include children over age 13 who in 1996 were not yet eligible for Medicaid.[17]

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[13] Testimony of Lisa Dubey and Genevieve Kenney before the US House Committee on Ways and Means, Sub-Committee on Health, April 8, 1997.

[14] These data do not permit us to identify working parents who have declined the coverage that they are offered at work.

[15] Children born after September 30, 1983 living below the FPL were eligible for Medicaid. Thus, in 1995 all poverty level children age 12 and under were eligible.

[16] Over 98 percent of firms with health benefits offer family coverage. See: "Employer Health Benefits," Health Research and Education Trust.

[17] In most states, children age 14 and older with incomes between the state's AFDC or Medicaid's needy income eligibility standard and the FPL were not eligible for Medicaid.

Figure 1
Estimated Enrollment Rate for Children with Access to Employer-Sponsored Insurance (ESI) in 1996 [a/]

Parents with employer-sponsored insurance all year who are not eligible for cash assistance but children are poverty level eligible for Medicaid.

Number of Medicaid eligible children (1000s)	3,016
Children enrolled in Medicaid (1000s)	1,466
Percent enrolled	48.6%

Estimated number of eligible and enrolled children with parents who have employer-sponsored insurance (ESI) all year by coverage status in the absence of the Medicaid expansion.

	Known (1000s)	Estimated (1000s)	Calculated as a residual (1000s)	Estimated Distribution (1000s)
Total enrolled	**1,466**	--	--	**1,466**
Would have been uninsured	Unknown	--	597 [b/]	597
Would have had ESI	Unknown	--	869 [b/]	869
Total eligible but not enrolled	**1,550**	--	--	**1,550**
Would have been uninsured	238	--	--	238
Would have had ESI	1,312	--	--	1,312
Total eligible	**3,016**	--	--	**3,016**
Would have been uninsured	Unknown	835 [c/]	--	835
Would have had ESI	Unknown	2,181 [c/]	--	2,181

Parents with employer-based coverage all year in families below poverty where children are ineligible for Medicaid (estimated of percent of children who would be uninsured without Medicaid).

Number of children (1000s)	676.1
Number Uninsured (1000s)	187.2
Percent Uninsured	27.7%

Estimated take-up rate for children with access to private coverage for expansion group.

39.8 percent (869 / 2,181)

Crowd-out estimate based on number of non-cash children enrolled in Medicaid by their parents' health insurance coverage status.

		Enrolled	Eligible
Children of parents with employer coverage (1000s)		1,466	3,016
Children who would have been covered	869		
Children who would have been uninsured	597		
Children of parents who do not have employer coverage (1000s)		3,169	6,767
Total non-cash children		4,635	9,783

Lewin Group Crowd-Out Estimate: 18.7% (869 / 4,635)

Note: Estimates include children of parents who are assumed to have employer coverage all year (i.e., we assume that persons reporting employer coverage in the CPS are covered for all weeks in which they worked).

a/ Eligibility was simulated using the Lewin Group Medicaid Eligibility Simulation Model (MedSIM). The enrollment data is what is reported in the CPS prior to correcting for under reporting.

b/ Calculated as a residual from numbers in the "estimated" column.

c/ Assumes that the percentage of children enrolled under these expansions who would have been covered under a parent's ESI in the absence of the program is the same as for Medicaid ineligible children with parents who have access to ESI who are living below the federal poverty level (FPL).

Source: Lewin Group Analysis of the March 1997 Current Population Survey Data

For example, the 1997 CPS reports that there were about 676,100 children living below the FPL who were ineligible for Medicaid who had parents with employer-sponsored insurance. Of these children, about 28 percent (187,200 children) reported that they were uninsured. These are likely to be cases where the parent took the coverage available to them through work but felt they could not afford the employee contribution required for family coverage. We assumed that the same proportion of Medicaid expansion children with access to employer–based coverage would have been uninsured in the absence of the program (i.e., 28 percent). This assumes that the percentage of parents with ESI who take the family coverage option is the same for parents with younger children as it is for parents with older children. This lowers our estimate of the take-up rate for children with access to ESI to 39.8 percent, which corresponds to an estimate of about 869,000 children who dropped employer coverage.[18]

Our estimated take-up rate of 39.8 percent is consistent with the Dubay and Kenney estimate of the percentage of new enrollees who shifted from employer coverage to Medicaid. For example, our estimate of the percentage of new enrollees who shifted to Medicaid under these expansions is equal to about 18.7 percent. This is equal to the number of enrollees that we estimate dropped private coverage (869,000) as a percentage of the total number of children covered in the expansion population (4.6 million). This compares with the Dubay and Kenney crowd-out estimate of 14 percent for pregnant women and 17 percent for children through age 11.

We used this estimated take-up rate (39.8 percent) as the basis for simulating enrollment under the Medicaid/SCHIP expansions. However, we adjusted this rate to reflect the fact that under SCHIP, states were required to adopt anti-crowd-out measures that were not in place in 1997 (i.e., the year of the data used to develop this estimate). This suggests that crowd-out should be less of a factor under current and future eligibility expansions. To account for this, we reduced the take-up rate by 10 percent to 36.1 percent. Thus, based upon this analysis, we assume that 36.1 percent of all persons with employer coverage who become eligible under the various Medicaid/SCHIP expansions would drop their private coverage and enroll. This assumption is applied uniformly to adults and children unless otherwise specified.

6. Impact of Anti-Crowd-Out Provisions

A number of proposals would require states to adopt provisions that minimize the substitution of public coverage for employer-sponsored insurance. One of the most widely used provisions under SCHIP is a requirement that applicants be uninsured for six months prior to enrolling. This is intended to make it impractical for individuals to drop their employer coverage for the purpose of shifting to the public program. However, it is difficult to know how effective these provisions have been. For example, states that have used this approach in their SCHIP program have specified exceptions for persons who have become uninsured involuntarily due to such things as becoming unemployed and unable to pay the COBRA premium. Moreover, states find it difficult to enforce these provisions because they have no contractual relationship with the employers who must be contacted to verify an individual's coverage status. Most states rely upon self-

[18] This estimate understates the take-up rate for persons with employer coverage because we can not identify children of parents who dropped employer coverage for their entire family when the children became eligible for Medicaid. This would occur in cases where the worker took family coverage primarily to cover the children.

disclosure or the "honor system" and have substantial flexibility in identifying exceptions. In addition, some states have eliminated these provisions based upon evidence that it excludes some needy individuals from the program. Consequently, it is difficult to know how effective this provision would be in preventing overt forms of crowd-out.

In the long run, however, these anti-crowd-out provisions are likely to have little impact on what we have termed "dynamic crowd-out". As discussed above, this is the process whereby persons who have become covered under the program, decline employer coverage when they move to a job offering a health plan to avoid paying the employee share of the premium, thus continuing with public coverage. This also represents crowd-out in that individuals are covered by the public program during periods where they otherwise would have had employer coverage.

Based upon conversations with various policy experts, we have assumed that these provisions are about 20 percent effective in preventing crowd-out. Thus, we assume that the average take-up rate for persons with employer coverage is reduced from our estimate of 36.1 percent to about 28.9 percent in proposals that specify six months waiting periods.

B. Private Insurance Subsidies

A number of the Coverage 2000 proposals include various programs that would subsidize individual purchases of private insurance. These subsidies include:

- A refundable tax credit to individuals to be used for the purchase of insurance in the private market;
- A program of vouchers redeemable for the purchase of private coverage;
- A tax deduction for purchases of non-group coverage;
- Providing a tax exemption for employee contributions toward employer health insurance regardless of the employer's Section 125 status;[19] and
- Permitting self-employed persons to deduct the full amount of their private insurance expenditures immediately.

We simulated the impact of these policies as programs that reduce the effective price of insurance coverage to affected individuals. For example, new tax credit programs or tax deductions for health insurance reduce the net after-tax amount paid for coverage by the individual, which is expected to result in an increase in the percentage of individuals obtaining coverage. Under this approach, vouchers, tax credits, tax exemptions and tax deductions all serve to change the price of coverage and are simulated in the same way.

[19] Under current law, the amount of an employee's contribution for health coverage is tax-exempt in firms that establish flexible benefits programs under Section 125 of the Internal Revenue Code.

1. Simulation of Coverage Effect

In this analysis, we estimated the change in the number of persons with health insurance resulting from alternative tax subsidy schemes using the Lewin Group Health Benefits Simulation Model (HBSM). HBSM is a microsimulation model of the US health care system, which is based upon a representative sample of the population that provides information on the income, demographic, and employment characteristics for each family member. These data also provide information on health coverage, service utilization, health expenditures, and premium payments. The model uses these data to identify persons who are potentially eligible for various subsidy programs, estimates the number of persons taking the subsidy, and estimates the impact on government costs and health expenditures.

The model uses the most recent population data available from the Bureau of the Census and health expenditure data from the Health Care Financing Administration (HCFA). The basic database used in the model is the 1996 Medical Expenditures Panel Survey (MEPS), which is the most recent data source available that provides information on coverage, expenditures, income, and employment characteristics. These data are adjusted to replicate the most recent data available on the number of persons by income, employment status, industry, age, sex, and coverage status as reported in the most recent Bureau of the Census CPS data (1999). This is done in a large, multistage, iterative proportional fitting process applied to the sample population data from CPS.[20] We use the HBSM tax module to impute information on tax deductions and marginal tax rates.

The health expenditure data are also adjusted to replicate health expenditure amounts reported in the national health accounts data compiled by the actuaries of the Health Care Financing Administration (HCFA).[21] Medicaid eligibility simulations were used to reflect expansions in children's enrollment under the SCHIP program that would occur between 1998 and 2001.

We used the HBSM model and data to identify individuals with employer-provided health coverage and the amount of the employer share of the premium that is tax-exempt. We then estimated the proportion of this population that is covered under Section 125 cafeteria plans where the employee share of the premium is also tax-exempt. We then used these tax data to calculate the tax subsidy resulting from these exemptions based on their marginal income tax rates and the applicable Social Security and Medicare tax rates. This provided estimates of the tax subsidies provided for health benefits under the current system.

We then used the data in the HBSM to identify persons who are potentially eligible for the various tax subsidies or vouchers available under each proposal. We computed the price of insurance that uninsured individuals would face in the individual market based on HBSM estimates of premium costs under employer plans by age of policy holder and family composition. This amount is reduced by 20 percent to reflect the fact that families are likely to

[20] This approach is similar to that used by the U.S. Bureau of the Census to develop family weights in the March CPS data.

[21] Smith, S., et Al., "The Next Ten Years of Health Spending: What Does The Future Hold?" *Health Affairs*; and recent unpublished projections by the Health Care Financing Administration (HCFA).

seek less costly policies in the individual market with higher co-payment requirements.[22] We then computed the after-tax cost of that insurance under current policy and for the tax subsidies provided under each proposal. The model estimates the number of uninsured who become insured based upon the change in the after-tax cost of insurance.

2. Modeling the Coverage Impact of Private Premium Subsidies

We estimated the increase in coverage under these tax provisions based upon a multivariate analysis of a broad range of factors affecting the level of private insurance coverage including the price paid for coverage. This analysis indicates that, on average, a one percent real reduction (i.e., inflation adjusted) in private employer premiums corresponds to an increase in the percentage of persons with insurance of 0.2 percent.[23] Thus, for example, an across the board one percent real reduction in private employee premiums would result in an increase in coverage of about 300,000 persons (the data and methods used here are presented in ***Attachment B*** of this Appendix.)

However, the sensitivity to price in this analysis varies with the income, age and demographic characteristics of the individual. For example, the percentage increase in coverage resulting from a one percent reduction in premiums ranges from a high of 0.34 among persons with incomes of $10,000 to 0.04 percent among persons with incomes of $100,000 ***(Figure 2).*** Similarly, the percentage increase in coverage resulting from a one percent reduction in premiums ranges from 0.27 percent for persons age 20 to 0.18 percent among persons age 60 ***(Figure 3).*** Thus, the model shows that older persons and persons in higher income groups are less sensitive to changes in price than other population groups.

The model also measures the extent to which changes in income affect coverage levels. The equation indicates that a one percent increase in income results in an increase in coverage of 0.367 percent. This element is important in this study because some proposals would cause employers to "cash-out" health benefits by canceling their plan and giving the savings to workers in the form of increased wages. This increase in income would have an "income effect" on coverage, which we are able to model through this variable.

We used this model to estimate both the increases and decreases in coverage that can occur as a result of these proposals. We developed Estimates of the increase in coverage under premium subsidy programs by estimating the percentage reduction in premiums for eligible persons. We then used the multivariate model to estimate the corresponding increase in the percentage of persons taking coverage. Similarly, we estimated the decline in coverage resulting from a net reduction in premium subsidies in cases where this occurs.

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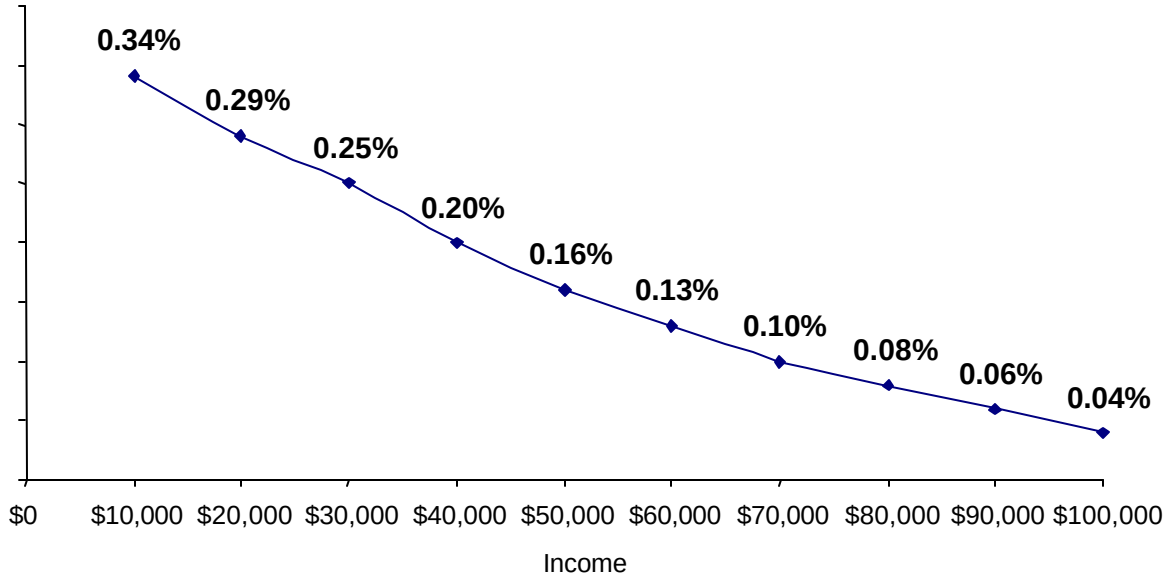
[22] This assumption is based upon the fact that non-group health expenditures (excluding Medicaid) in the MEPS data are roughly 20 percent less than spending for employer coverage on an age and sex adjusted basis.

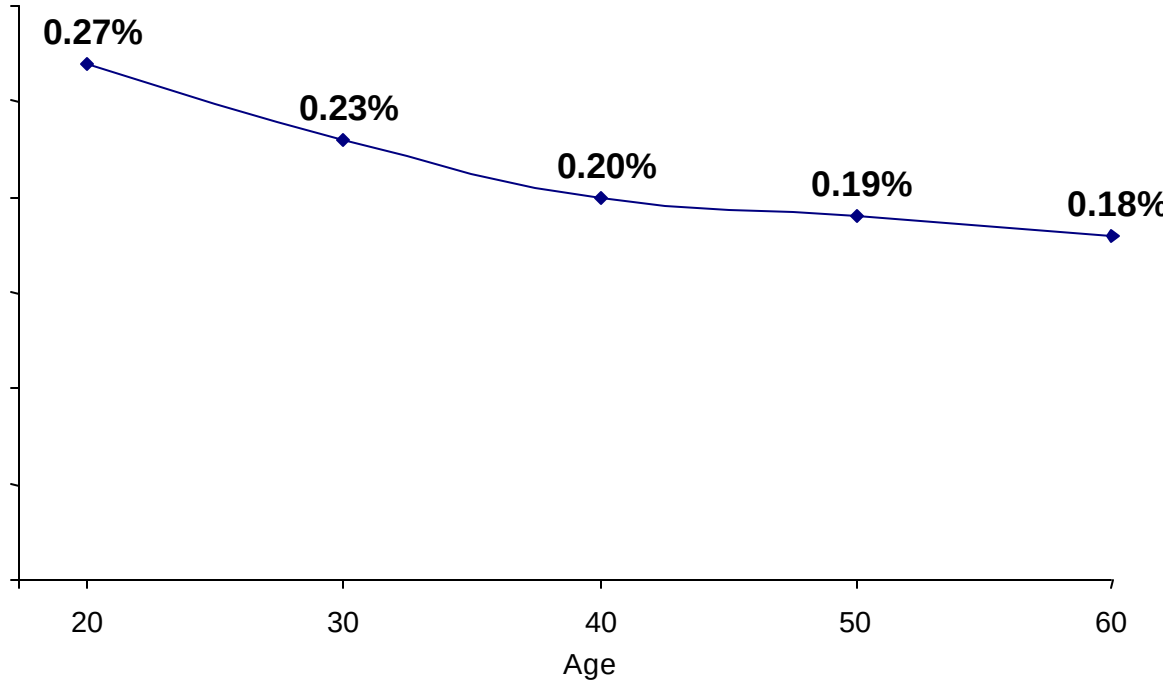
[23] An estimate of this type is called an "Elasticity". See Sheils, J., Haught, R., "Health Insurance and Taxes: The Impact of Proposed Change in Current Federal Policy", (report to The National Coalition on Health Care), The Lewin Group, October 18, 1999.

Figure 2:
Percentage Increase in Coverage Resulting from a One-Percent Reduction in Premiums by Income Level (in percentages)



Source: Lewin Group estimates

Figure 3:
Percentage Increase in Coverage Resulting from a One-Percent Reduction in Premiums by Age (in percentages)



Source: Lewin Group estimates

In this analysis, we apply this model uniformly to all factors leading to a change in the net cost of insurance to the individual. For example, a one percent increase in premiums due to a premium tax is assumed to have the same impact as a one percent premium increase due to an expansion of benefits or patients rights. Arguably, these changes should have a different impact on coverage because one represents a pure price increase while the other represents a change in the nature of the good being purchased. Unfortunately, our multivariate model does not permit us to differentiate the demand affects based upon the nature of the price change.

We also assume that vouchers and tax credits of the same nominal value would have the same impact on the demand for insurance, despite their differing implications for administration of benefits. For example, most working individuals could obtain their tax credit on an ongoing basis throughout the year simply by adjusting their tax withholding at work, whereas individuals would be required to apply with a separate agency for vouchers. However, under a tax credit, many lower-income persons who do not now pay taxes would have to file a tax return to get the benefits, which could become a disincentive to participating in the program. Therefore, enrollment levels could differ depending upon the administrative approach used.

However, in practice, the administration of the tax credits may often be similar to the administration of vouchers. This is because lower income persons would need to go to a government agency to apply for advance payments of the tax credit to be used to purchase insurance during the year. This is likely to involve a process quite similar to that required to administer a voucher program. Unfortunately, there is little empirical evidence on how participation would vary under these two administrative models.

Moreover, we assume that these programs will be administratively feasible. For example, we assume that under the various tax credits, an effective mechanism is developed to provide these subsidies throughout the year when coverage is purchased so that the individual does not have to wait until tax returns are filed at the end of the year to receive the subsidy. In fact, there may be substantial problems in developing such a system, which could substantially reduce the program's effectiveness with lower-income populations.

3. Lags in Enrollment

We assume that it would take up to two years for newly eligible persons to learn of their eligibility for these subsidies and enroll. We assume that only about half of the uninsured who we estimate will take coverage due to these subsidies actually obtain coverage in the first year. In the second year, we assume that 80 percent of those who we estimate would ultimately take coverage do so in the second year with the full impact of these subsidies on coverage occurring in the third year of the program. Thus, we assume that these subsidy programs are not fully implemented until the end of the second year.

However, we assume that all currently insured individuals take whatever subsidies are available to them beginning in the first year of the program unless they are simulated to drop coverage in response to changes in tax subsidies (see discussion below). This assumption of full participation among eligible persons who now have coverage might seem strong in view of the low levels of participation in the earned income tax credit (EITC). However, persons who have private coverage typically have high enough incomes that they are required to file a tax return with the

IRS. Thus, it is reasonable to assume that all of these individuals would claim the health insurance credit simply by following the line-by-line instructions on the tax form, which would be modified to calculate the credit. This differs from the EITC where many of those who are eligible for the credit have such low income that they are not required to file, and as a consequence do not file for the credit.

4. Employer Tax Credits

The impact of small employer tax credits is also modeled using our multivariate model of price sensitivity. The literature on employer sensitivity to the price of insurance is sparse and inconsistent. In fact, recent research has shown that the percentage of workers who are offered employer coverage has actually increased over the past ten years despite dramatic premium increases over this period.[24] This suggests, for example, that employers may tend to react to premium increases by increasing employee premium contributions, as has occurred over the past decade, rather than actually terminating coverage. Employers may also respond by shifting to managed care plans or cutting back on the benefits package.

Thus, to simplify the analysis, small employer tax credits were simulated as a reduction in the cost of insurance to the individual worker. This is consistent with the expectation that the ultimate affect of these subsidies is to subsidize the purchase of coverage for the worker rather than the employer. Thus, for example, a 25 percent small employer tax credit is modeled as a 25 percent reduction in the after-tax cost of insurance to the worker in eligible firms. Changes in coverage for affected persons are estimated using the same coverage model described above based upon the amount of the tax credit subsidy. The population data used in our model has been statistically matched to an employer data base that provides information on wages and health benefits which enables us to estimate the impact of tax credits where eligibility is linked to the average wage of firm employees or other firm characteristics.

We assume that employers do not respond in ways that are designed to maximize tax credit payments. For example, the small employer tax credits examined in this study limits eligibility to firms with average wage levels per worker below the national average for all small firms. Employers could respond by shifting to part-time workers or substituting non-wage compensation for wages to stay below the average wage requirement. In addition, larger firms may find it less costly to lay-off some workers and outsource their functions to smaller firms that are made more price-competitive because they receive the credit. None of these potential effects are estimated in this analysis.

5. Fixed Dollar Tax Credits or Vouchers

Proposals have been introduced in Congress and by the American Medical Association (AMA) that would replace the existing exemptions and deductions for health insurance with a system of tax credits or vouchers that provide a fixed dollar subsidy amount for the purchase of insurance. These proposals would tend to increase coverage among lower income persons because the

[24] Cooper, P.F., Schon e, B.S., "More Offers, Fewer Takers for Employment-based Health Insurance: 1987 and 1996", *Health Affairs*, November/December, 1997, Volume 16, Number 6.

amounts of the tax credit are typically greater than the value of the tax exemption for these groups due to their low marginal tax rates. However, the net impact of the program on coverage would be determined by the structure of the tax credit or voucher.

It is possible for coverage to decline for some population groups in cases where an individual's current tax subsidies are replaced with a smaller premium subsidy amount under the new program. For example, some tax credit proposals would replace the current employer tax exemption for health benefits with a fixed dollar tax credit (e.g., $1,000 per adult plus $500 per child, etc.). Under these proposals, the subsidy amount for lower-income persons is typically larger than the value of the tax exemption to the individual (based upon the individual's marginal tax rate). However, the tax credit amount for higher-income persons often would be less than the value of their current exemption. In these instances, the model estimates increases in coverage among lower-income persons receiving an increased subsidy and a reduction in coverage among middle- and higher-income persons who are negatively affected by the shift to a tax credit or voucher.

In addition, the incentives for employers to continue providing coverage would be reduced substantially under the fixed-dollar tax credit model. This is because under most of these proposals, the worker receives the same tax credit amount regardless of whether they obtain their coverage through an employer or the non-group market. Once the tax advantage of employer coverage is removed, many employers may "cash-out" their health benefits by canceling their employer plan and giving the savings to the worker as increased wages that they can use to purchase coverage on their own with the help of credit. However, this approach changes the dynamics of coverage by requiring the individual to face the full cost of coverage (less the tax credit amount) rather than just the after-tax employee share of premiums as under most employer plans. This increase in the price of coverage to the worker at the point of purchase could result in a loss of coverage, particularly among older persons who would now face age rated premiums in the individual market.

In this analysis, we assumed that employers would continue to provide coverage through their existing "defined benefit plan" if they are able to do so for less than the cost of comparable coverage in the individual insurance market. For example, administrative costs as a percentage of benefit payments range from about 3.5 percent in large firms to as high as 40 percent for small firms.[25,26] This difference in administrative costs reflects the fact that there are economies of scale in administrating large employer health plans. By comparison, administrative costs for individually purchased insurance typically ranges between 20 percent and 40 percent of benefits; although we assume that it would be about 20 percent in the voluntary choice cooperatives established under proposals such as the AMA model. Thus, we assumed that employers who are able to provide coverage at a lower cost would continue to do so while others would shift to the defined contribution model.

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[25] "Costs and Effects of Extending Health Insurance Coverage",(Report to the subcommittee on Labor-Management Relations), Congressional Research Service, October 1988.

[26] In the Health Benefits Simulation Model (HBSM) we estimate employer administrative costs based upon the data provided by CRS. However, we assume that administrative costs are equal to about 20 percent of claims for small firms participating in existing purchasing coalitions, which comprises about one-third of small employers offering health benefits.

Based upon these assumptions, we estimate that there are about 26.6 million workers and dependents in firms that would shift to the defined contribution model. This represents about two-thirds of all workers and dependents in firms with 50 or fewer workers.[27] We assume that these individuals would receive an increase in wages equal to what the employer would have spent on health benefits. These individuals would then be able to purchase coverage with these added wages (after-tax) and the tax credit. However, as discussed above, some of these individuals may chose to keep the wages for other uses and go without coverage.

We estimated the reductions in coverage for persons who see an increase in their cost of coverage due to either a reduction in tax subsidies or the termination of employer plans using the multivariate coverage model discussed above. In addition, our simulation of changes in coverage under these cash-out scenarios reflects the effect that the resulting increase in wages would have on coverage. Our multivariate model of private coverage indicates that on average, a 1.0 percent increase in income is associated with a 0.36 percent increase in the percentage of persons taking coverage. In our analysis, the increase in wages due to a benefit cash-out is reflected together with the change in premium payments in estimating the change in coverage for persons in firms that cash-out their coverage. Thus, our estimates reflect both the price and income-effects of these proposals.

6. Employer Response to Non-group Premium Tax Credit or Voucher

We also modeled possible employer responses under these proposals that could lead to reductions in employer coverage for some workers. For example, some proposals would create tax credits or vouchers for purchases of non-group coverage while leaving the existing employer health benefits exemption unchanged. Under such a policy, some employer groups may find that their employees are on average better off if the employer cashes-out their plan by terminating coverage and giving the savings to the workers in the form of higher wages. Workers can then use these wages to obtain coverage in the non-group market with the help of the tax credit.

These benefits cash-outs are most likely to occur in insuring firms with lower-wage workers where the value of the tax exemption to the worker can be less than the value of a tax credit for the purchase of non-group coverage. However, not all of these individuals would obtain non-group coverage due to the increase in the amount of the premium that they would be required to face (i.e., the non-group premium less the credit as compared with the employee contribution amount). This is a particular concern among older workers who would face age rated premiums in the non-group market.

In this analysis, we assume that employers would seek to assemble the most efficient compensation package possible for their workers. Thus, we assume that employers cash-out their employer-sponsored health coverage in cases where their workers would on average be better off purchasing non-group coverage with the help of the credit. We modeled this employer behavior

[27] We assume that small employers who currently obtain coverage though group-purchasing cooperatives will continue with this form of coverage. It is estimated that about 33 percent of establishments with fewer than 10 employees and 28 percent of establishments with 10 to 49 employees purchase health insurance through some type of group purchasing cooperative. See: Stephen H. Long and M. Susan Marquis, "Pooled Purchasing: Who Are The Players?", *Health Affairs*, Vol. 18, No. 4 (July/August 1999), pp. 105-111.

with data based upon a representative sample of employers, which provides information on the income and demographic characteristics of their workforce.[28] We estimated the changes in coverage for affected persons using the multivariate model described above based upon the difference between the non-group premium less the credit or voucher and their after-tax employee premium contribution under their current employer plan.

7. Medical Malpractice Reforms

Some proposals would adopt medical malpractice reforms designed to limit medical liability costs. We assume that these reforms would have the effect of reducing premiums resulting in an increase in the number of persons with private health insurance. We assume that these reforms would reduce private insurance premiums by about 0.4 percent This is based upon estimates developed by the Congressional Budget Office (CBO) for a bill with similar malpractice reforms showing that such provisions would reduce private insurance premiums by between 0.3 and 0.5 percent.[29] We simulated the impact of malpractice reform on coverage using the multivariate coverage model discussed above.

8. Administration

Throughout these analyses, we have assumed that these proposals are administratively feasible. In fact, mechanisms would need to be developed to implement the various tax credit and voucher proposals. For these programs to be effective, there would have to a way of getting the tax credit to individuals at the time they are purchasing coverage rather than waiting until the following spring to get the credit in a refund from the federal treasury. This is particularly true for low-income persons who cannot afford to "front" the cost of insurance until tax refunds are distributed in the following year.

This problem could be remedied under a program where a uniform tax credit is available to all individuals regardless of income. Under such a system, the insurer could collect the credit from the US Treasury on a monthly basis as partial payment for coverage based on their enrollment ledgers. However, it is unlikely that this approach would be used under a tax credit where eligibility or the amount of the credit varies with income. This is because employers and insurers do not have the information required to determine income eligibility. Moreover, insurers seeking to maximize enrollment would have a conflict of interest in determining whether individuals are eligible for the credit.

Advance payments of the tax credit could be arranged through the employer withholding system as is currently done with the EITC.[30] However, experience with the existing EITC advance payment system suggests that it may not be a very effective means of disbursing advance

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[28] We use the 1991 Health Insurance of American (HIAA) data, which is the most recent employer survey data available which provides information on the income and demographic characteristics of the employer's workers.

[29] Congressional Budget Office, Preliminary Cost Estimate, Patient Protection Act of 1998, (H.R. 4250).

[30] Under this advance payment system, the expected amount of the credit is offset against the individual's expected tax payments to allow eligible individuals to receive a greater portion of their gross income in their paycheck. In cases where the refundable EITC amount is greater than the expected tax payment, the difference is available to the individual when needed.

payments of a health insurance tax credit. This is because the system is sufficiently complex for workers and employers to use that only a small fraction of those who are eligible for the EITC use it. It is doubtful that the advance payment system would be any more effective where health insurance tax credits are concerned. Consequently, it may be necessary to establish an ongoing income eligibility determination process that may operate much like that used in Medicaid.

C. Changes in Insurance Markets

The various proposals include a wide range of changes in the health insurance market that are designed to expand coverage. These include proposals that would pre-empt state mandated benefits, create high risk pools with or without premium subsidies, encourage the development of voluntary purchasing cooperatives, and permitting individuals to purchase coverage through the federal employees health benefits program (FEHBP). Our assumptions on the impact of these provisions are as follows:

- **Pre-empt State Mandated Benefits** – Some of the proposals would eliminate state requirements that all health insurance policies sold in the state include certain benefits. In addition, one of the Coverage 2000 proposals would extend ERISA to cover multiple employer groups which would also have the effect of pre-empting state benefits mandates. In this analysis, we assume that these provisions have the effect of reducing the cost of insurance for affected groups by five percent. This estimate is based upon the assumption used by the Congressional Budget Office (CBO) in their recent analysis of association health plans and healthmarts which was based upon a review of the literature on the impact of state benefits mandates.[31] We simulated the impact of these provisions as a reduction in the cost of insurance for workers in fully insured plans resulting in a corresponding increase in coverage for affected persons (i.e., self-funded plans are already exempt from state benefits mandates under ERISA). We estimated the number of persons taking coverage using the multivariate model of private coverage described above.

- **High Risk Pools** – High risk pools are assumed to have little net impact on coverage if they are funded with an assessment on all insurance sold in the market. The reason for this is that while such an approach would affect premium payments for "uninsurables", it also increases premiums for others and is likely to have little net impact on coverage. However, high risk pools that are subsidized with government revenues are assumed to result in lower overall premiums in the non-group market. These reductions in premiums are assumed to result in an increase in coverage which we estimate using the multivariate model of private coverage described above. We assume that all high risk pools are funded with an assessment on insurance unless otherwise specified.

[31] The CBO Report analyzed the impact of pre-empting benefits mandates for multi-employer groups and healthmarts. In this analysis, we apply the CBO savings estimate of five percent to all affected fully insured plans and non-group insurance purchased in the individual market. See: The Congressional Budget Office, (CBO), "Increasing Small-Firm Health Insurance Coverage Through Association Health Plans and Healthmarts", January 2000.

- **Voluntary Purchasing Cooperatives** – Proposals to expand the availability of coverage through purchasing cooperatives are assumed to have little impact on coverage except to the extent that they reduce costs by pre-empting state mandated benefits. Similarly, we assume that giving individuals access to coverage through the FEHBP will have little net impact on premiums and coverage.

- **Medical Savings Accounts** – Some proposals would expand the availability of Medical Savings Accounts (MSAs) by lifting the limit on MSA enrollment (750,000 policies) imposed by Congress under the Health Insurance Pintability and Accountability Act (HIPAA). However, as of 1999, only about 50,000 policies had been purchased. Because the number of MSA enrollees is below the current limit, eliminating this limit should have little or no impact on coverage. Moreover, many of the persons who would take MSA policies would be simply shifting from their current source of coverage to the MSA with little net change in coverage. Consequently, we assume that the expanded availability of MSA coverage will not affect health insurance coverage levels.

- **Encouraging the Use of Existing Options** – Proposals that merely "encourage" the use of existing group purchasing models or tax subsidies that are already permitted under current law are assumed to have no impact on coverage.

The cost of programs to subsidize the purchase of private health insurance are assumed to increase in proportion to the increase in private insurance health spending as projected by the actuaries of the Health Care Financing Administration (HCFA) for 2001 through 2010. This results in an average annual rate of increase in private premium subsidies of about 6.0 percent per year.

D. Universal Coverage Proposals

We tried to be as consistent as possible in specifying the assumptions used in our analyses of the two universal coverage proposals that were introduced in the Coverage 2000 conference. These include the SEIU proposal, which begins with a Medicaid/SCHIP expansion followed by an employer/individual coverage mandate, and the American Nurses Association's (ANA) universal Medicare coverage proposal.

To facilitate comparisons, we developed estimates of the impact of these proposals assuming that universal coverage under both plans is fully implemented in 2001, even though each of these plans would not be fully effective until a latter date. However, for budgetary purposes, we also present estimates of government program costs according to the actual implementation schedule in the plan.

However, these proposals are sufficiently unique in scope and approach that we needed to develop some assumptions that were specific to both plans. These assumptions are specified in our documentation of assumptions for these individual plans in other appendices to this report. Assumptions that are common to these two proposals include:

- Estimates were developed using the Lewin Group Health Benefits Simulation Model (HBSM), which is based upon the 1996 National Medical Expenditures Survey (MEPS) and the 1999 current population survey data; aged to 2001;

- Health expenditures estimates for 2001 are based upon projections of health spending by type of service and source of payment developed by the actuaries of the Health Care Financing Administration (HCFA);

- The growth in health spending through 2010 is also based upon HCFA projections;

- Uninsured persons are expected to increase their utilization of health services once they become insured under the single-payer program. In prior studies, we have estimated the increase in health services utilization for the uninsured population by assuming that utilization for uninsured persons would increase to the levels reported by insured persons with similar age, sex and health status characteristics.[32] Based upon this analysis, we estimate that health services utilization among those who are currently without insurance would increase by 70.1 percent. Drugs, dental care and mental health services are assumed to increase in similar proportions for persons who currently are not covered for these services (i.e., the under-insured);

- Employers are assumed to provide supplemental coverage for services that they now cover under their plans which would not be covered under the universal coverage proposal; and

- States are assumed to retain Medicaid to cover services and copayments for currently eligible persons that are now covered by Medicaid but would not be covered under the universal coverage benefits package.

In addition, we assume that all increases in employer costs under these proposals are passed on to employees in the form of reduced wages. The universal coverage proposals introduced by the ANA and the SEIU would rely upon employers to provide financing for the program through payroll taxes and/or a mandate to provide coverage. This differs from the other six proposals, which do not require employers to pay for health benefits. Based upon previous research, we assume that 88 percent of the increase in employer costs under these two proposals is passed on to workers in the form of wage reductions. We estimated the reduction in federal income and payroll tax revenues resulting from this reduction in earnings using the HBSM tax module.

E. Caveats

Many of the proposals considered in this study have never been attempted on a broad scale in the United States. Consequently there are little data on the likely outcomes of such programs that can be used to estimate their impacts. In particular, programs that substantially restructure the health care financing system could substantially alter consumer, employer and provider incentives, which could have a significant impact on program costs. Our analysis also does not address any potential changes in the quality of care provided under these reform proposals.

[32] "The Financial Impact of *The Health Security Act*," The Lewin Group, Inc., December 9, 1993.

Although our analyses are based upon the best data and research now available, the estimates should be considered illustrative of potential program impacts rather than point estimates of actual outcomes. In fact, our analysis indicates that the ultimate impact of these proposals on government health spending and coverage is very sensitive to assumptions on employer and consumer behavioral responses under the new incentives created by these programs.

Furthermore, the estimates are based on projections of the rate of growth in health spending which are themselves especially sensitive to a number of factors including general economic growth and health care cost trends. For example, it is very difficult to predict the states' willingness to implement optional expansions in coverage. It is also difficult to predict enrollment behavior among newly eligible groups, many of whom are in substantially different economic and family circumstances than the currently eligible population. Consequently, policy makers should recognize that any major health initiative is likely to require continued refinements in program design and financing over time.

ATTACHMENT A

ESTIMATING A PARTICIPATION FUNCTION FOR THE MEDICAID PROGRAM

In this analysis, we developed two multivariate models of participation among persons who are eligible for public health insurance coverage. The first is a model of enrollment for persons who meet the income, eligibility and family composition requirements of the Medicaid program. The second is a model of enrollment in public health coverage programs where the eligible family/person is required to pay a portion of the cost of coverage in the form of a premium.

In general, our approach was to estimate the number of persons who meet the income and family structure requirements (e.g., families with children, etc.) of these programs in each state. We then developed a multivariate model of how the percentage of eligible persons who enroll varies with age, income, work status and other factors affecting enrollment. These multivariate models are then used in our Medicaid eligibility simulation model (MedSIM) to estimate the number of newly eligible persons who would enroll. Thus, our approach is to extrapolate from the enrollment behavior of the currently eligible persons to persons who would be newly eligible for the program

A. Medicaid Participation

The available data indicate that there are a large number of persons who appear to be eligible for Medicaid who do not enroll. In this analysis, we estimated the percentage of income eligible persons who participate in the program by category of eligibility using the March Current Population Survey (CPS). Based upon these data, we estimated a multivariate model of how program participation varies by age, income, health status and other socio-economic characteristics. This multivariate model was then used in our simulation models to estimate the proportion of newly eligible persons who enroll under the various proposals to expand eligibility for Medicaid.

The data used in this analysis was the March 1998 CPS, which includes income and coverage data for 1997. The CPS is a representative sample of the population which includes both U.S. citizens and foreign nationals living in the U.S. For each person in each household selected for the survey, these data provide information on key demographic characteristics such as age, sex, race, ethnicity, family type, source of health coverage, state of residence and health status. These data also provide information on income from various sources, employment status and weeks of employment. These data permit us to identify persons who meet the various categories of eligibility such as children, single parent families, two parent families and the aged. They also enable us to estimate monthly family income reflecting changes in employment status during the year.[33]

[33] The CPS data report annual income for each individual. We used the MedSIM model to allocate income over the months of the year. For example, annual income from earnings is distributed across the reported number of weeks of employment, unemployment compensation is distributed over the reported number of weeks of unemployment; workers compensation is typically allocated over weeks not in the labor force; and income from social security, pensions and investments is uniformly allocated across each month.

We used the Lewin Group Medicaid eligibility simulation model (MedSIM) to estimate the number of persons who appear to meet the eligibility criteria for the program using these monthly income data and the actual income eligibility criteria used in each state's program. The model first organizes the CPS population into program filing units, which consist of families or specific family subgroups. For example, parents and their children are grouped together as a single family while unmarried adults are typically treated as separate filers even if they are living with others.[34]

The model starts by identifying the filing units that qualify for coverage under the program. Typically, families with children are potentially eligible while non-disabled childless adults generally are not, except in waiver states. The model then determines eligibility for each filing unit on a month-by month basis using the actual income eligibility levels used in their corresponding state of residence.

Using this approach, we estimated the average monthly number of eligible persons by category of eligibility. As shown in ***Table A-1***, we estimate that there were on average, about 43.0 million persons who were eligible for the program during 1997.[35] About 14.8 million of these persons were eligible under the Aid to Families with Dependent Children (AFDC) and AFDC-related income eligibility criteria while about 8.6 million were eligible under the supplemental Security Income program (SSI).[36,37] It also includes about 3.1 million persons who had incomes between the Aid to Families with Dependent Children (AFDC) program payment standard and the medically needy income eligibility level (in states with a medically needy program). Another 11.5 million were pregnant women and children with incomes above the AFDC and/or medically needy income standards who were eligible under the various expansions in eligibility to the poverty level and beyond adopted by Congress in the early part of the 1990s.[38] In addition, we estimate that about 5.0 million Medicaid recipients are eligible for supplemental Medicare benefits.

[34] Households can include multiple filing units. For example, a single woman with three children who lives with an aged parent would include two filing units: one for the mother and her children; and one for the grandparent.

[35] Excludes persons in institutions (e.g., nursing homes).

[36] These are the income eligibility levels that, before welfare reform, were used to determine eligibility and cash assistance benefits under the Aid to Families with Dependent Children (AFDC) program, now called the Transitional Assistance for Needy Families (TANF) program. Persons were assumed to meet the disability criteria under the Supplemental Security Income (SSI) program if they are: non-age persons who reported they were receiving social security benefits or Medicaid coverage; or non-aged persons who reported disability as a reason for being out of the labor force.

[37] Includes children age 1 to 5 below 133 percent of the FPL, children ages 6 to 15 below 100 percent of the FPL and pregnant women with incomes below 133 percent the FPL (185 percent of the FPL at the states options).

[38] Includes persons eligible for Medicaid payment for Medicare copayments and the Medicare Part-B premium as a Qualified Medical Beneficiary (QMB). Also includes Medicare beneficiaries that qualify for Medicaid payment of their Part-B premium as Special Low-Income Medicare Beneficiaries (SLMBs).

Table A-1

Estimates of the Number and Percent of Persons Eligible for and Enrolled in Medicaid on an Average Monthly Basis by Category of Eligibility Using CPS and Program Data in 1997

		CPS Reported Data: Underreported		Program Enrollment Data: Fully Reported	
	Persons Eligible (Thousands)	Persons Enrolled (Thousands)	Percent Enrolled	Persons Enrolled (Thousands)	Percent Enrolled
AFDC and AFDC-Related	**14,816**	**9,751**	**65.8**	**12,073**	**81.5**
Children	9,275	6,040	65.1	7,799	84.1
Pregnant Women	541	432	79.9	498	92.0
Other Adults	4,322	3,279	65.6	3,778	87.4
Medically Needy	**3,757**	**2,007**	**65.2**	**2,811**	**74.8**
SSI Population	**8,563**	**4,366**	**51.0**	**6,323**	**73.8**
Aged	3,515	1,185	33.7	2,504	71.2
Disabled	5,078	3,181	62.6	3,819	75.2
QMB/SLMB Population	**4,983**	**1,051**	**21.1**	**1,679**	**33.7**
Expansion Groups	**11,507**	**5,621**	**48.9**	**7,853**	**68.3**
Children	10,595	5,123	48.4	7,042	66.5
Pregnant Women	912	498	54.6	811	88.9
TOTAL	**42,978**	**22,796**	**53.0**	**30,739**	**71.5**

a/ Excludes persons in institutions. All counts are on an average monthly basis.
b/ The number of persons who are eligible for Medicaid was estimated from march 1998 CPS data.
c/ Includes persons who reported that they were enrolled in the year prior to March 1998 CPS.
d/ Average monthly enrollment by eligibility group derived from the HCFA 2082 data. Excludes 1.3 million institutionalized Medicaid recipients.
e/ Includes children who qualify under the AFDC income limits but are not receiving cash assistance.
f/ Persons were assumed to meet the disability criteria if they report illness or disability as the primary reason for not being employed or out of the labor force. We are unable to identify in the CPS, children who are eligible for, bur not enrolled as SSI disabled children.
g/ Includes persons eligible for Medicaid as a supplement to their Medicare coverage including Qualified Medicare Beneficiaries (QMBs) and persons eligible for Medicaid coverage of their Medicare Part-B premiums as Special Low-Income Medicare Beneficiaries (SLMBs).
h/ Includes 663,000 disabled persons who are age 65 or older. See *Social Security Bulletin*, Winter 1995.
Source: Lewin Group estimates using the Medicaid Eligibility Simulation model (MedSIM) and the 1998 and 1999 Current Population Survey (CPS) data.

The CPS data report that of the 43.0 million persons eligible for the program, only about 22.8 million were enrolled in any given month.[39] This is an overall average participation rate of 53.0 percent. The percent participating ranged from a low of 21.1 percent to a high of 79.9 percent among pregnant women who are AFDC eligible.

[39] Months of enrollment were derived in four steps. First, the number of months enrolled in Medicaid is reported in the CPS. Second, we assumed that persons who reported employer sponsored coverage were covered during each of the months in which the policyholder was employed (months were derived from the reported number of weeks worked). Third, persons who reported Medicare or CHAMPUS coverage, were assumed to be covered all year. Fourth, persons reporting non-group private coverage were assumed to be covered under this policy during months when they did mot have coverage from some other source.

However, the CPS reports substantially fewer Medicaid recipients than actually participated in the program as enrolled in the Medicaid program data. According to the program data, there were an average of about 30.7 million persons enrolled in each month during 1997 (excludes persons in nursing homes). Thus, the CPS underreports Medicaid enrollment by about 25 percent. When we compare actual program enrollment to our CPS estimate of the number of eligible persons, we get an overall average participation rate of about 71.5 percent.

B. Multivariate Participation Model

We used these simulated eligibility data to estimate a multivariate model that summarizes how the percentage of eligible persons enrolling varies with the characteristics of the individual. The data used in this model includes all persons simulated to be eligible for the Medicaid program based upon the income eligibility levels used by each state in 1997. We included only the eligibility groups that are expected to be most like the groups that would become covered under the proposed eligibility expansions. These include the AFDC and AFDC-related persons, persons meeting the medically needy income level (i.e., excluding the spend-down population) and children who became eligible under the various children's eligibility expansions in the early 1990s. The aged and the disabled were excluded because their circumstances are sufficiently unique that we do not believe we can extrapolate from their experience to the newly eligible groups. Eligible persons were classified as participants if they indicated in the CPS that they were enrolled under Medicaid (our correction for underreporting is discussed below).

We estimated a logistic function from these cross-sectional data using the maximum likelihood method. The model is of the form: $\ln\left(\frac{p}{1-p}\right) = z,$ where P is the proportion of eligible persons who enroll, and Z represents the sum of the products of the estimated coefficients and the corresponding values of the explanatory variables (i.e., age, income, etc.). This approach was used because it has the feature of bounding the model's estimate of the proportion of eligible persons with Medicaid between 0.0 and 1.0

In the cross-sectional estimation, the dependent variable is equal to 1.0 if the eligible individual participated in the program and 0.0 if the individual was eligible but not enrolled. The explanatory variables include age, sex, race, ethnicity, self-reported health status, income, and whether or not this family includes a worker. We also included a variable indicating whether the individual is eligible for cash assistance to measure how this dual eligibility affects enrollment. This variable is likely to be a good predictor of enrollment even though the linkage between cash assistance and Medicaid has been eliminated under welfare reform. In addition, we included variables indicating whether the individual has access to employer coverage through a parent or a spouse (i.e., spouses and parents with employer coverage).

The chi-square statistics for the model indicated that these variables were statistically significant at the 99.9 percent confidence level (***Figure A-1***). We also estimated the same model using the ordinary least squares (OLS) model specification and found that all of the variables were significant at this level except for the Asian status variable which was significant at only the 94 percent confidence level.

Figure A-1

Logistic Estimate of Medicaid Participation Function

Variable Name	Variable Definition	Parameter Estimate	Pr> Chi-Square
Intercept		1.0597	0.0001
Age 6	Age less than 6	-0.7273	0.0001
Age 12	Age 6 – 12	-0.6338	0.0001
Age 18	Age 13 – 18	-0.8527	0.0001
Age 24	Age 19 – 24	-0.6029	0.0001
Age 34	Age 25 – 34	-1.0297	0.0001
Age 45	Age 35 – 45	-1.0604	0.0001
PoorH	In poor health	1.1464	0.0001
FairH	In fair health	0.9178	0.0001
GoodH	In good health	0.3957	0.0001
Vgood	In very good health	0.2044	0.0001
WorkFam	Worker in family	-0.3383	0.0001
Fincome	Family income/100,000	1.9258	0.0001
Black	Black	0.1602	0.0001
Asian	Asian	-0.0991	0.0001
Hispanic	Hispanic	-0.2242	0.0001
CashElig	Also eligible for cash assistance	0.4432	0.0001
PrivateC	Parent with employer coverage	-1.0829	0.0001
PrivateS	Spouse with employer coverage	-0.6872	0.0001

Source: Lewin Group estimates.

The estimated coefficients for the logit model are difficult to interpret because the logit function is essentially non-linear and is expresses in terms of the natural log probability distribution. However, the direction of the effects can be readily interpreted based on the sign (positive or negative) of the estimated coefficients. We can also examine the relative importance of the variables included in the equations by comparing the size of the various coefficients.

The signs of the estimated coefficients are generally consistent with what we would expect. For example, the likelihood of enrollment is highest for persons in poorer health (the omitted value for health status is "excellent" health). Also, persons who are eligible for cash assistance have a greater likelihood of enrolling. The probability of enrollment also declines among families with workers, which may reflect the availability of employer-sponsored coverage for some lower-income workers. In addition, the equation shows that the likelihood of enrollment increases with income, which is generally consistent with the idea that income increases, people are more likely to seek coverage as a means of asset protection.

The impact of age on enrollment varies by age group. The equation indicates that the percentage of persons enrolled in the program generally declines with age, where age 55 to 64 is the omitted age group. Among the remaining age groups, young adults age 19 to 24 have the highest enrollment rate (i.e., the negative value on the age variable for this group is lower that among other age groups). This may reflect the fact that this age group includes a large share of pregnant women who have a much higher enrollment rate than other eligibility groups (see ***Table A-1*** above).

This function is built into the MedSIM model and is used to simulate enrollment under various expansions in eligibility. The model first identifies individuals in the CPS data that are eligible under the income and eligibility criteria specified in the policy (e.g., increased income eligibility levels; coverage for non-disabled childless adults). The equation shown in ***Figure A-1*** is then used to estimate the probability (ranging from 0.0 to 1.0) that these individuals would enroll under the program. Individuals are then randomly selected to enroll based upon the estimated probability that they would participate. Thus, we extrapolate from the enrollment behavior of currently eligible persons under current policy to estimate enrollment for newly eligible groups.

C. Impact of Premiums on Enrollment

As policy makers consider increasing the income eligibility levels for Medicaid/SCHIP, an increasing number of proposals have emerged that would require individuals to pay some portion of the cost of the coverage in the form of a premium. For example, under SCHIP, states are permitted to require premiums for children living above 150 percent of the FPL as long as total cost sharing does not exceed five percent of income. Several of the coverage 2000 proposals developed by the eight participating groups would also permit states to required such premiums for the adults that they propose to cover under the Medicaid/SCHIP model.

Premium contribution requirements are expected to reduce the percentage of eligible persons who enroll. In fact, reduced participation has been reported in states that have established even very small premium requirements including Tennessee and Washington. However, there is little data available on the impact of premium contribution requirements on enrollment.

In this analysis, we developed an equation which measures how participation varies with the amount of the premium contribution using data on persons eligible for the programs covering adults under the Washington basic health plan and the Minnesotacare program. The Washington program covers adults through 200 percent of the FPL under their basic health plan program where enrollees are required to pay a premium. Minnesota has a similar program, which covers adults through 275 percent of the FPL, also with a premium requirement.

We estimated a participation function for these two programs using CPS data. The CPS identifies persons who are covered under public programs other than Medicaid. Using MedSIM, we were also able to estimate the number of persons who are eligible for the programs in these two states using the actual eligibility provisions in these states. We determined the premium that each individual would be required to pay using the actual premium schedules used in these two programs. In both states, the amount of the premium payment increases with the income of the family/individual.

We used these data to estimate a participation function which measures the impact of premiums on the likelihood of enrollment. To increase sample size, we pooled the Washington and Minnesota CPS data for 1997, 1998 and 1999. We estimated a logistic function similar to that described above which includes a parameter for the premium amount. The results of this estimation are shown in ***Figure A-2***.

Figure A-2

Estimated Logistics Model of Participation for Public Programs that require a Premium Contribution

Variable Name	Variable Definition	Parameter Estimate	Pr> Chi-Square
Intercept		-0.7482	0.0001
FamIncom	Family Income	0.000012	0.0001
Premium	Premium Contribution Amount (monthly)	-0.0007	0.0001
LY19	Age less than 19	-0.1280	0.0001
LT30	Age 19 – 29	-0.6399	0.0001
LT45	Age 30 – 44	0.000744	0.0001
PoorH	Poor health	1.8335	0.0001
FairH	Fair health	0.7250	0.0001
GoodH	Good health	0.4021	0.0001
Black	Black	0.1746	0.0001
Working	Worker in family	0.1928	0.0001
FamSize1	Family size of 1	-1.3399	0.0001
FamSize2	Family size of 2	0.3053	0.0001

Source: Lewin Group Estimates.

Based upon this analysis, we estimate that even a small premium requirement substantially reduces the probability of enrolling in the program. For example, the participation rate for an "average adult" would decline from about 65 percent without a premium requirement (as indicated in our analysis of Medicaid enrollment above), to about 39 percent with even a very small premium.[40] The likelihood of participating is reduced even more as the premium amount is increased.

The participation function shown in ***Figure A-3*** was used to simulate enrollment for all individuals facing a premium under the various coverage 2000 proposals.

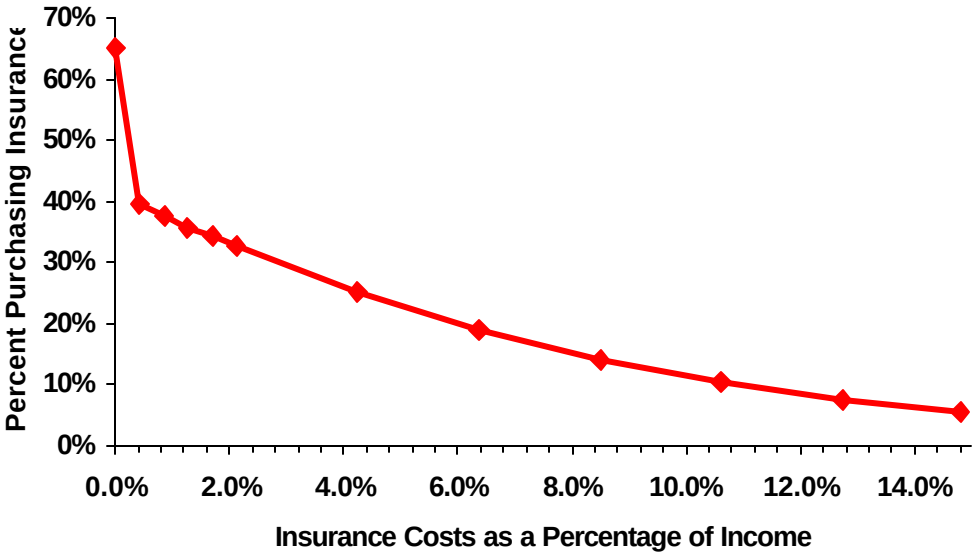
D. Underreporting

As discussed above in Appendix A, the participation functions described above are estimated from CPS data, which underreports Medicaid enrollment by about 23 percent. Thus, these functions are likely to under estimate enrollment under the various eligibility expansions. Consequently, we increased the predicted probabilities of participating by 23 percent under both participation functions.

[40] We used the Medicaid participation function to estimate the probability of enrollment for an individual with the average value for each of the explanatory variable. The participation function shown in Figure A-2, was then used to estimate the percentage of persons who would enroll at a given premium level using the same method.

Figure A-3

Estimated Percentage of Persons Who Will Take Subsidized Coverage by Premium Cost as a Percentage of Family



a/ Based upon percentage of persons eligible to participate in Medicaid who enroll.
b/ Probabilities of enrollment initially based upon the percentage of persons without insurance who purchased non-group coverage by family income as a percentage of income.
Source: Lewin Group Estimates.

E. Crowd-Out

As discussed above, we estimate that about 36.1 percent of eligible children with access to employer coverage would terminate their private coverage and shift to Medicaid. Based on these data, we assume that on average about 36.1 percent of newly eligible persons who have employer-sponsored insurance would enroll under the coverage expansions. This is less than half of the average enrollment rate for persons with no other source of coverage (estimated to be about 65 percent).

To account for this coverage substitution effect, we calibrated the predicted probability of enrollment from the equations discussed above to show an overall average enrollment level of 36.1 percent for newly eligible persons with employer coverage. This approach adjusts the overall enrollment rate for this group to the predicted level while permitting enrollment rate variation by income, age and other factors controlled for in our participation functions

F. Persons Eligible Under Current Law

In general, we assume that persons who are eligible but not enrolled under the current Medicaid/SCHIP program will not enroll under future expansions of Medicaid eligibility. For

example, our analysis indicates that on an average monthly basis, there are about 43.0 million persons eligible for Medicaid, of whom only about 30.7 million are enrolled under the program (see ***Table A-1*** above). This leaves about 12.2 million (i.e., 43.0 – 30.7) Medicaid eligible persons who are not enrolled.

We assume that these individuals are not induced to enroll in the program due to changes in the eligibility that do not affect them. However, we do simulate an increase in enrollment for currently eligible non-participating Medicaid/SCHIP children in cases where their parent(s) become eligible and enrolled under a coverage expansion proposal. We also estimate an increase in enrollment among currently eligible persons under proposals that emphasize increased outreach or provide additional subsidies to states as an incentive to increase enrollment. The methods that we use to simulate these initiatives are typically tailored to the individual proposal.

ATTACHMENT B

ESTIMATING THE IMPACT OF TAX CREDITS ON INSURANCE COVERAGE

In this analysis, we estimated the impact of health insurance tax credits and other tax subsidies on the number of persons with insurance coverage. The principle is that these various tax subsidies effectively reduce the net cost of health insurance to the individual, which increases the proportion of persons purchasing coverage. Therefore, our analysis focused on measuring the change in coverage resulting from a given change in the net after-tax price of insurance. Our approach was to use The Lewin Group Health Benefits Simulation Model (HBSM) to estimate the prices faced in the market for uninsured persons. We then estimate the change in prices resulting from these tax subsidies, and estimate the number of uninsured persons who would take coverage based on estimates of how a change in the price of insurance affects the likelihood that an individual will take coverage

The key assumption in our analysis is the assumed price elasticity for demand for insurance. Price elasticity is defined as the percentage change in persons purchasing coverage given a 1.0 percent change in price. The elasticity estimate that we used in this analysis is based on an analysis of the impact of changes in the employee contribution amount in employer plans on the number of workers and dependents taking coverage conducted by The Lewin Group, Inc., in 1998.[41] This study indicated a price elasticity of 0.2 percent, which means that on average a 1.0 percent real increase (i.e., increase after standardizing for price inflation) in premium (i.e., price) was associated with a 0.2 percent reduction in coverage. Weighted to national coverage numbers, this estimate indicates that a 1.0 percent increase in premiums results in a loss of coverage for about 300,000 persons.

In this attachment, we describe the data and methods used to develop this price response model.

A. Data and Methods

Our analysis is based on the March Current Population Survey (CPS) data for 1989 through 1996. The CPS is a survey of households conducted by the Bureau of the Census. It includes information on employment, earnings, and sources of health insurance coverage. We pooled the CPS data for each year between 1989 and 1996 to create a pooled time-series, cross-sectional database. These data provide much of the information required to measure the impact of changes in demographic and economic factors on the level of employer coverage over time. For example, these data provide the information required to analyze how employer coverage has changed as a result if changes in earnings, industry of employment, and other employment and demographic characteristics of workers.

While the CPS data provide much of the information required to measure factors affecting coverage, they do not provide information on the price of insurance. To correct for this, we imputed the amount of the employee share of premium payments to workers in the CPS who

[41] Sheils, John F., Hogan, Paul, and Manolov, Nikolay 1998, "Exploring the Determinants of Employer Health Insurance Coverage," (Report to the AFL-CIO).

indicated that they have employer coverage on their jobs. We did this based on the average employee share of premiums for single and family coverage reported in the National Medical Expenditures Survey (NMES) for workers with employer coverage. These data were adjusted over time based on the average rates of growth in employee spending as reported in two data sources. These were the KPMG Peat Marwick employer surveys for 1991 through 1996, and the Health Insurance Association of America (HIAA) survey data for employers from 1988 through 1990.[42,43] In addition, we adjusted the share of the premium paid by the worker based on the average percentage of premiums for employer coverage paid by the employee as reported in these employer surveys for 1988 through 1996.

The average premium for employer-sponsored health benefits has been increasing more rapidly for family coverage than for single coverage. Between 1988 and 1996, average premiums for family coverage increased by 111 percent, from $2,530 in 1988 to $5,349 by 1996. Premiums for single coverage increased by only 79 percent over that period, from $1,153 in 1988 to $2,059 in 1996 (***Table B - 1***). This may help explain much of the rapid decline in employer-sponsored insurance for children in recent years.

However, the overall average percentage of premiums paid by employees has increased more rapidly for single coverage than for family coverage. The reason for this is that while most firms have long required at least some contribution toward family coverage, many firms did not require a contribution for employee-only coverage until recently. For example, the Bureau of Labor Statistics (BLS) reports that the percentage of workers required to contribute to the cost of single coverage increased from 28 percent in 1980 to 63 percent by 1993. By comparison, the percentage of workers required to contribute to family coverage increased from 49 percent in 1980 to 79 percent in 1993. Thus, the overall average percentage of the premium paid by the worker increased more rapidly for employee-only coverage than for family coverage over the 1988 through 1996 period.

Over the 1988 through 1996 period, average employee contributions for health benefits increased by 283.9 percent for employee-only coverage and 145.6 percent for family coverage. Adjusting for inflation, the real increase in average employee premium contributions over the 1988 through 1996 period was 189.4 percent (14.2 percent annually) for employee-only coverage and 85.1 percent (8.0 percent annually) for family coverage. This reflects both increases in premiums and increases in the share of the premium paid by the worker. The premium contribution amounts that we imputed to the CPS data for the 1989 through 1996 period reflect these estimates of the differential growth in premium contributions for employee-only and family coverage.

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[42] Hewitt Associates 1996, "Salaried Employee Benefits Provided by Major U.S. Employers in 1990 and 1995: A Comparison Study," 1996.

[43] This was done by solving the multivariate models that we estimated as described above where the means for demographic variables were changed from their 1989 levels to the actual levels in each year while holding all economic variables (such as premiums, earnings levels, and industry of occupation) constant at their 1989 levels. These equations were normalized to actual reported coverage levels in each year to ensure that predicted values are comparable to actual coverage levels.

Table B - 1
Growth in Employee Premium Share for Employer Coverage 1998 Through 1996 [a/]

	Employee-Only Coverage				Family Coverage			
	Average Premium	Percent Paid by Worker [b/]	Average Contribution [c/]	Real Growth in Employee Share [d/]	Average Premium	Percent Paid by Worker [b/]	Average Contribution [c/]	Real Growth in Employee Share [d/]
1988	$1,153	10.2%	$118	- -	$2,530	26.0%	$658	- -
1989	$1,360	13.9%	$189	52.8%	$2,985	25.0%	$746	8.1%
1990	$1,537	14.9%	$229	14.9%	$3,585	28.0%	$1,004	27.7%
1991	$1,738	13.0% [e/]	$226	-5.3%	$4,307	23.0% [e/]	$991	-5.3%
1992	$1,883	16.6%	$313	34.5%	$4,747	25.5%	$1,210	18.5%
1993	$2,040	16.3%	$333	3.0%	$5,232	26.6%	$1,392	11.7%
1994	$2,111	16.2%	$342	0.4%	$5,512	28.4%	$1,565	9.7%
1995	$2,042	19.9%	$406	15.4%	$5,284	29.4%	$1,553	-3.5%
1996	$2,059	22.0%	$453	8.4%	$5,349	30.2%	$1,615	1.0%
Average Annual Growth 1988 - 1996	7.5%	10.1%	18.3%	14.2%	9.8%	1.9%	11.9%	8.0%
Total Percent Growth 1988 - 1996	**78.6%**	**115.7%**	**283.9%**	**189.4%**	**111.4%**	**16.2%**	**145.6%**	**85.1%**

a/ KPMG Peat Marwick, 1991-1996 and HIAA data for 1988-1990.

b/ This is the overall average percentage of the premium paid by the worker, including both covered workers who contribute to the cost of coverage and those who are not required to make an employee contribution.

c/ Estimate reflects the combined effect of premium price increases and increases in the percentage of the premium paid by the worker.

d/ Includes adjustment for inflation.

e/ There are differences in the survey methods used in the HIAA and the KPMG survey designs that make these data less than strictly comparable. This may be the reason for the abrupt drop in the percent of premium paid by workers between 1990 and 1991.

Source: Lewin Group estimates.

Using the CPS data for 1989 through 1996, we estimated three separate multivariate models of employer-sponsored health insurance coverage for workers, dependent spouses, and dependent children. The first multivariate model estimates the probability that a worker is covered by an employer plan. The explanatory variables include demographic characteristics that are correlated with coverage such as age, race, ethnicity, marital status, and whether the individual is the family head. The model also includes employment-related variables such as industry and occupation of the worker, the size of the employing firm, the full-time/part-time status of the worker, and worker earnings. We also included a variable indicating whether individuals are covered under Medicaid to measure the impact of expanded coverage under Medicaid on employer coverage levels. In addition, we included the imputed amount of the employee share of the premium, which over time reflects changes in both premium amounts and the percentage of the premium paid by the worker.[44]

The second multivariate model estimates the likelihood that spouses of covered workers will have coverage as a dependent spouse. The explanatory variables used in the model include age, race, ethnicity, family income, and an estimate of the incremental cost of electing the family coverage option. The incremental cost of coverage was calculated by taking the difference between the average family premium and the average employee-only coverage premium for a given firm size/industry group. The third model, which is similar to the model of spousal coverage, estimates the likelihood that children of parents who have employer coverage will be covered as dependents.

These multivariate models were estimated using a logit estimation methodology, which is ideally suited to estimate models where the dependent variable is bounded between zero and one. These models provide a basis for measuring the impact of the price of insurance and various economic and demographic factors on the level of coverage for workers and dependents over the 1989 through 1996 period, given the level of employment in these years. They also provide a basis for projecting coverage levels in future years under alternative assumptions concerning premium growth, employee contribution shares, and other economic factors in future years.

B. Multivariate Analysis

As discussed above, we developed multivariate models that show how the proportion of persons with employer coverage changes as demographic and economic factors change over time. We did this by estimating logistic functions of the form $\ln\left(\frac{p}{1-p}\right) = z$, where p is the proportion of persons with employer coverage, and z represents the sum of the products of the estimated coefficients and the corresponding values of the explanatory variables (i.e., earnings, age, etc.). This approach has the unique feature of bounding the model's estimates of the proportion of persons with employer coverage to between 0.0 and 1.0. In general, the explanatory variables that we included in these employer coverage models were statistically significant at the 99.5 percent confidence level.

[44] In addition, we included time variables that were used to account for changes in the CPS health insurance questionnaire over the 1988 through 1996 period.

As discussed above, the estimated coefficients for the logit model are difficult to interpret because the logit function is essentially non-linear. However, the direction of effects can be interpreted based on the sign (positive or negative) of the estimated coefficients. For example, the workers equation generally indicates that Blacks, Hispanics and Asians are less likely to have coverage than is the average population ***(Figure B –1).*** These estimates also show that coverage levels go down as the employee contribution amounts increase and that coverage increases as income rises. In general, the direction of the effects estimated for the various explanatory variables is as expected. However, it is difficult to discern the magnitude of these effects from the coefficients.

To measure the magnitude of the effects of these variables, we solve the estimated equations under selected variations in the explanatory variables. Solving the equation simply means computing the proportion of persons with coverage by use of the estimated coefficients and various assumptions on the mean values of the explanatory variables.[45] For example, we can obtain the average coverage levels in 1996 by solving these equations for that year using the actual means for the explanatory variables in that year.[46] We can then test the sensitivity of estimated coverage levels to changes in the employee premium contribution amount by varying the assumed premium level from the 1996 value and calculating the change in the estimated coverage level. Similarly, the sensitivity of coverage to changes in other explanatory variables can be estimated using this method. In this analysis, we use this approach to measure the magnitude of the effect that changes in the various explanatory variables have had on coverage since 1989.

[45] The estimated equations are solved as $p = \frac{1}{1+e^{-z}}$, where *p* equals the proportion of persons with employer coverage, and *z* is the sum of the products of the assumed values of the explanatory variables and their respective coefficients.

[46] We normalized the model estimates to the actual levels of coverage in each year to assure comparability with actual data.

Figure B - 1

Estimated Parameters for Logistic Health Insurance Coverage Equations [a/]

Worker Coverage Equation [b/]		Dependent Spouse Equation [g/]		Dependent Children Equation [g/]	
Variable	**Parameter Estimate**	**Variable**	**Parameter Estimate**	**Variable**	**Parameter Estimate**
Intercept	-2.2193 *	**Intercept**	2.1809 *	**Intercept**	2.4909 *
Black	-0.2473 *	**Age**	0.00395 *	**Age**	-0.0252 *
Hispanic	-0.4089 *	**Black**	-0.6189 *	**Black**	-0.5849 *
Asian	-0.2549 *	**Hispanic**	-0.5798 *	**Hispanic**	-0.6667 *
Married Family Head	0.0324 *	**Asian**	-0.3743 *	**Asian**	-0.3106 *
Spouse of Family Head	-0.4789 *	**Family Income [h/]**	1.4446 *	**Family Income [h/]**	1.4545 *
Age/100	5.1666 *	**Premium Amount[i/]**	-0.4978 *	**Premium Amount[i/]**	-0.3005 *
Age/100 Squared	-4.3975 *	**Covered by Medicaid**	-1.2692 *	**Covered by Medicaid**	-1.5798 *
Earnings/100,000 [c/]	3.1224 *	**Time**	0.6190 *	**Time**	0.0203
Full-Time Worker	1.2653 *	**Time Squared**	0.1067 *	**Time Squared**	0.3098 *
Premium Amount/1000 [d/]	-0.7579 *				
Covered by Medicaid	-1.1174 *				
Covered by Medicare	-0.5279 *				
High-Coverage Occupation [e/]	0.4636 *				
High-Coverage Industry [f/]	0.3112 *				
Firms with Fewer than 25 Workers	-1.7485 *				
25 - 99 Workers	-0.6366 *				
100 or More Workers	-0.2090 *				
Time	0.0614 *				
Time Squared	0.1029 *				

	R-Squared
Worker Equation	0.4161
Dependent Spouse Equation	0.0713
Dependent Children Equation	0.1146

* Significant at the 99.5 percent level.

a/ Note that the logit is a non-linear estimation technique. The parameters are not directly interpreted as derivatives. If p is proportion covered, the derivative with respect to a continuous variable x_i is $b_i(p)(1-p)$, where b_i is the parameter, and the elasticity is $b_i(1-p)x_i$.

b/ The equation estimates the likelihood that an employed person has employer-based coverage.

c/ Includes annual earnings reported by the worker in 1996 dollars.

d/ The employee share of premiums for covered workers was imputed to the CPS based upon individual's reported industry, firm size and state of residence. Amounts in 1996 dollars. Reflects both price increases and increases in the percentage of the premium paid by the employee.

e/ Identifies workers employed in a high-coverage occupation. A high-coverage occupation is defined as one where the average percentage of workers with coverage is greater than the overall average percentage of workers with coverage.

f/ Identifies workers employed in a high-coverage industry. A high-coverage industry is defined as one where the average percentage of workers with coverage is greater than the overall average percentage of workers with coverage.

g/ The universe of persons included in the analysis is dependents of workers who do not have coverage on their own jobs.

h/ Total income of all family members in 1996 dollars.

i/ Includes the incremental cost to the employee of electing the family coverage option in 1996 dollars. Reflects both premium price increases and increases in the share of the premiums paid by the employee.

Source: Lewin Group estimates using a pooled cross-section of individuals from the March Current Population Surveys for 1988 through 1996.